DD250

operating instructions

ultrasound technologies

Contents

Introduction

This booklet explains the operation and use of the FETATRACK DD250 desk doppler. Care has been taken during the design and manufacture of this product so that it satisfies all of the current safety standards set down by BS EN60601-1-2006.

The **DD250 is a mains or rechargeable battery operated desk** Doppler designed to suit the needs of the General Practitioner and clinic where multiple disciplines require interchangeable transducers.

The **DD250** can take a choice of 4 transducers, 2 for fetal heart rate detection (2 and 3 MHz) and 2 for vascular flow detection (5 and 8MHz). The **DD250** provides for the audio presentation of the fetal or vascular signal as well as digital fetal heart rate detection with the fetal heart rate displayed on an LCD display. RS232 data port is included for the transfer of data to a PC to review the fetal heart rate traces.

The instrument is supplied complete with the following:
Doppler Instrument with an option of interchangeable transducers of 2, 3, 5 or 8MHz chosen at time of ordering .
Mains Cord
Operating instructions
Coupling gel

The following symbols have been used on the instrument and are defined as:-


Type B equipment


Consult accompanying documents

Alternating Mains Current

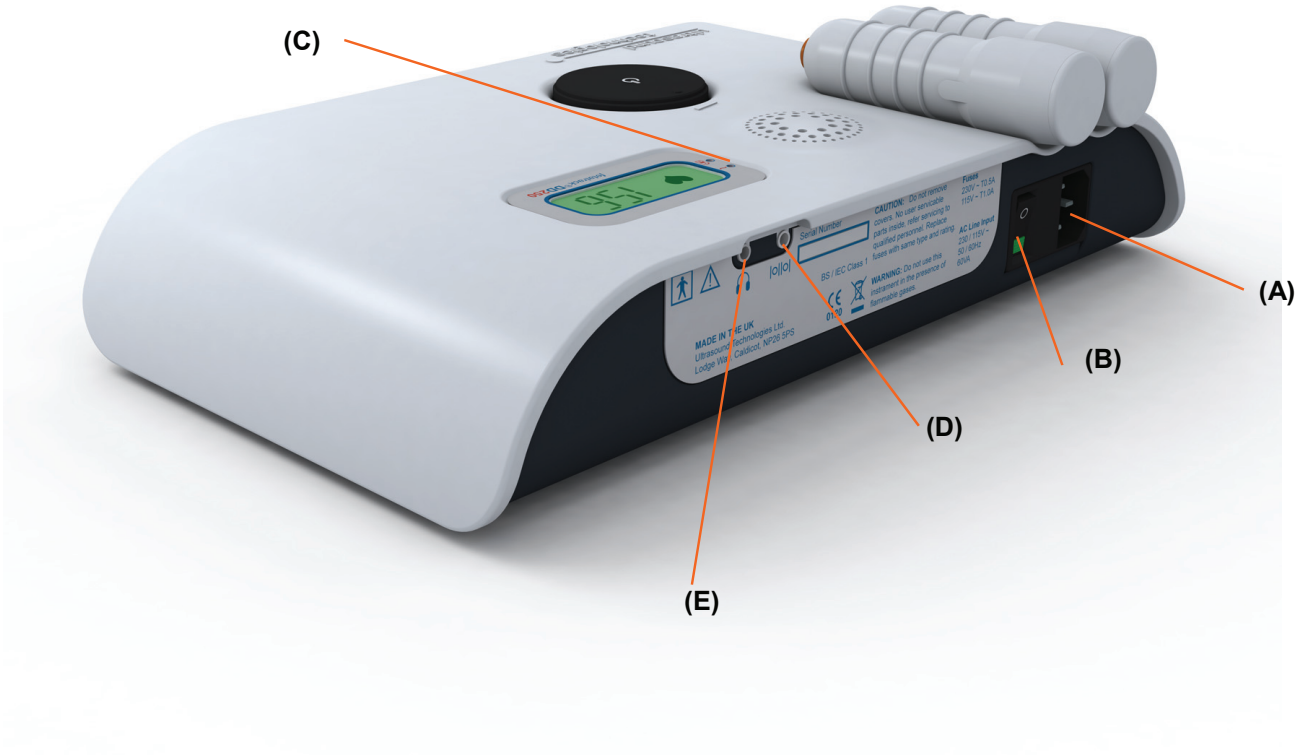

DO NOT disposed of with your normal waste


Unit On / Off


Battery Charge / Discharge state

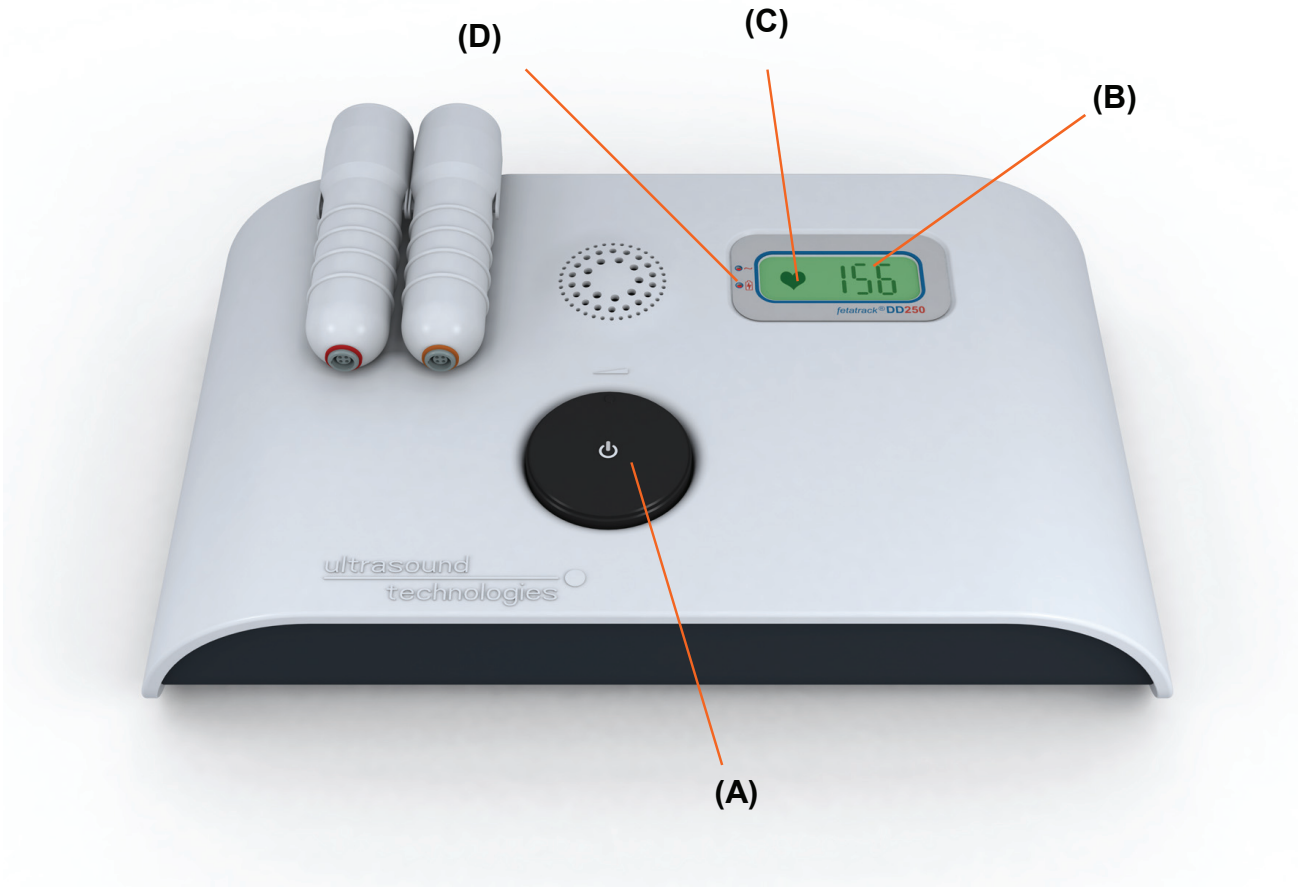
Before using your DD250 for the first time, please read these operating instructions carefully.

DD250



The **DD250** is powered from an external mains power supply or from internal rechargeable batteries. To connect to mains insert the mains cord into connector **(A)** found in the back of the unit and the turn the mains switch **(B)** to its on position. The mains switch will be illuminated green when AC mains power is connected, this indicator is repeated on the units front panel **(C)**.

Serial RS232 connection can be made by attaching the optional serial link cable to socket **(D)** on the rear of the unit (contact supplier for further details) with the optional headset connected at **(E).**



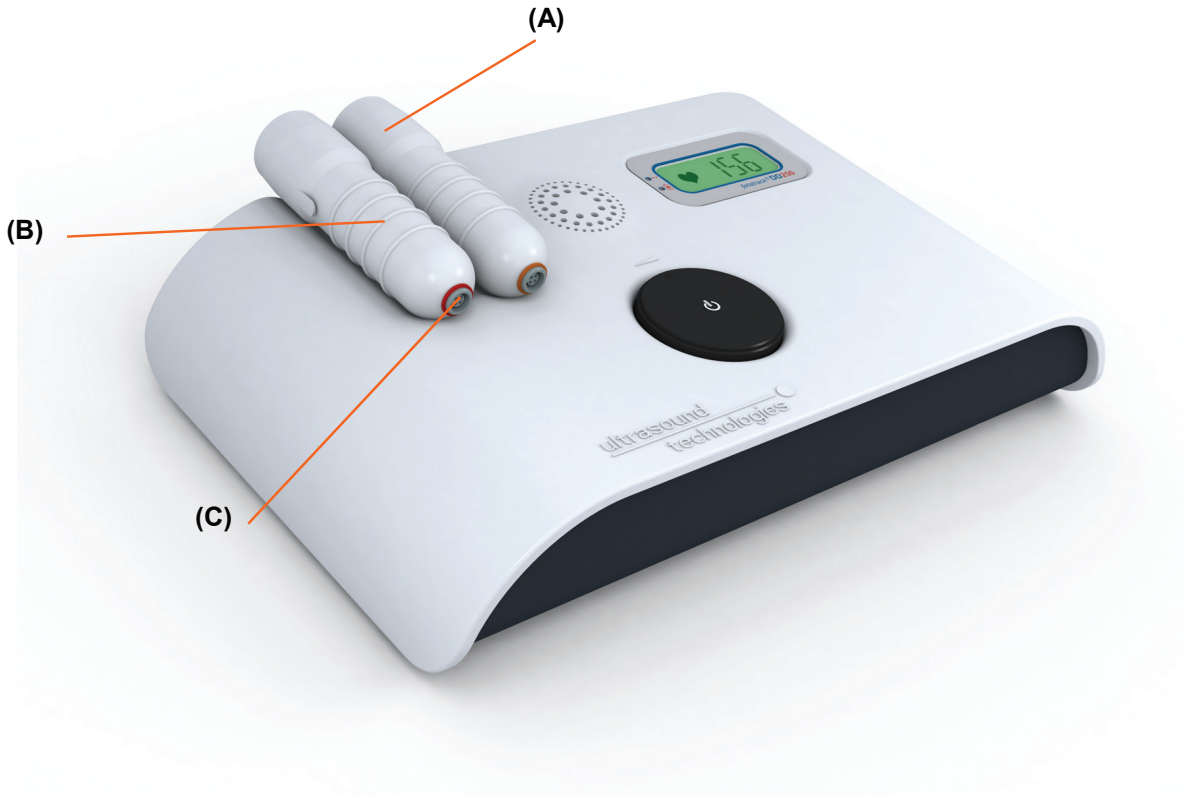
The **DD250** operates by pressing the on/off control **(A)**, this control also alters the audio volume by rotating clockwise to increase and left to anticlockwise to decease.

The micro-controller monitors the detected signal and turns the unit off when no signal has been detected for approximately 2 minutes.

The LCD displays battery condition and fetal heart rate **(B)**. A battery icon is displayed when the battery requires changing. The fetal pulse icon **(C)** flashes at approximately the same rate as the detected fetal heart.

When charging the internal batteries the charge state is indicated by a flashing indicator **(D)** when fully charged the indication will be fully on.

DD250



The DD250 includes a storage area from 2 transducers (**A).** These are held in place using magnetic retention.

There is a choice of up to 4 transducers that can be used with the DD250, 2 for fetal use and 2 for vascular use. These are connected to the DD250 using a retractile cable with a latching connector.

The selected transducer **(B)** is connected to the unit by the connector **(C)** , to disconnect pull back on the outer cover of the connector, **DO NOT TWIST**. To connect a transducer align the red dots and lightly push the connector into the transducer socket.

The transducers are colour coded at the socket to indicate frequency.

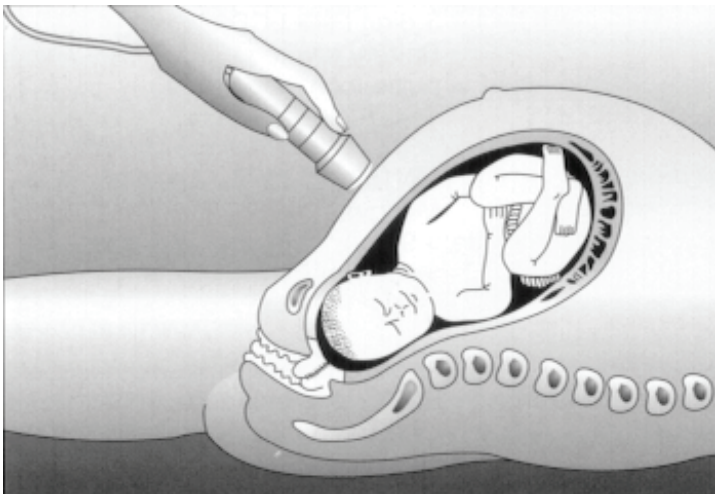
Transducer colour coding

Connector ring colour

2MHz	**Red**
3MHz	**Orange**
5MHz	**Green**
8MHz	**Grey**

Fetal heart detection

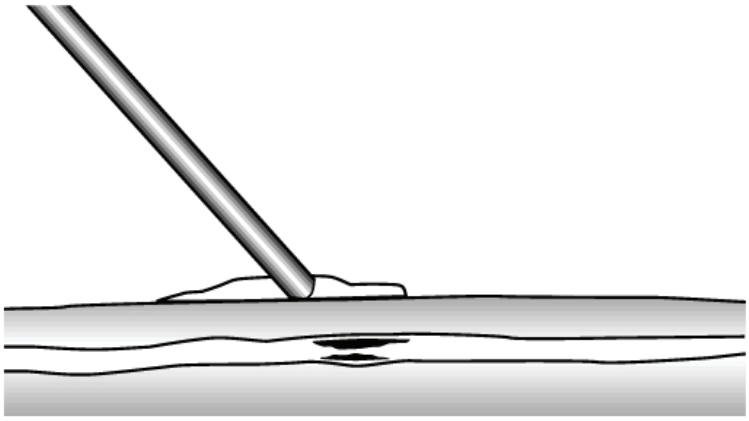
The **DD250** can be used to detect the beating fetal heart from approximately the 10th week of gestation, though this will vary between patients.
Apply a liberal amount of coupling gel to the area just above the symphysis pubis and position the transducer face flat against the abdomen. Tilt the transducer slowly until the fetal heart is heard in the loudspeaker or headset (in early pregnancy the headset helps to eliminate ambient noise making it easier to detect the weaker signals).
Later on in pregnancy the best signals are generally found higher up the abdomen.
Avoid sliding the transducer over the abdomen as this results in an increase in the background noise and makes it more difficult to detect the fetal heart sounds.



The **DD250** may be used to locate the position of the placenta, thus aiding in the early diagnosis of placenta praevia or eliminating placental site where amniocentesis is to be performed.
The sound from the placenta is an indistinct swishing, caused by bloodflow in many vessels. There is no distinct beat pattern to the sound.
The vessels of the umbilical cord give rise to a higher pitched sound than the normal fetal heart, with pulsations at the fetal rate.

Vascular flow detection

The **DD250** can be used to detect both surface vessels, deeper arteries and veins using either the 5MHz or 8MHz transducers.
To obtain the best signal, apply a liberal amount of coupling gel to the area of the vein or artery under investigation. Tilt the transducer at approximately 45 degrees to the vessel. Arteries give a high pitched pulsatile sound, with veins giving a sound like a roaring wind. The optional headset helps to eliminate ambient noise, making it easier to detect the weaker signals.



It is also usual for the **DD250** to be used in association with a pressure cuff and sphygmomanometer to indicate the location and extent of arterial occlusion in the form of ankle/brachial pressure index and segmental pressures.
Due to the variation of leg blood pressure over a wide range with the systemic pressure, the actual values are less useful than the pressure index, which relates the ankle pressure to the pressure obtained at the brachial artery. Using the **DD250** to measure both pressures will ensure compatibility. In cases where patients have peripheral arterial disease using the **DD250** , due to its high sensitivity, can be the only technique suitable for the measurement of leg blood pressure.

$$\text{Pressure Index} = \frac{\text{Ankle systolic pressure}}{\text{Brachial systolic pressure}}$$

Normal - ankle systolic pressure > brachial pressure.
Normal pressure index >1
Abnormal pressure index <1

Specification

DD250

Ultrasound

Frequency	2, 3, 5, 8 MHz continuous wave
Transducer	2 crystal narrow beam (interchangeable)
Output Power	<10mW/cm2
Audio Response	300Hz—1KHz (2, 3 MHz) 300Hz—4KHz (5, 8 MHz)
Fetal Heart Rate	Multipoint real time autocorrelator 50—210 bpm

Unit Controls

Keys	1 key for unit on / off (Push Volume control)
Controls	Rotary Volume
Indicators	LCD Display with icon for battery low and pulse, battery charge LED, mains on LED.

Power Supply

AC Input Voltage	200 – 260 VAC or 100 – 130 VAC
Frequency	46-64Hz
Power	20VA
Battery Charge Life	>30 hours of use (battery's will self discharge when not used)
Battery Charge Time	<5hours

Output

Headset	Audio output to optional headset
Communication	RS232 Interface

Enclosure

Material	PC/ABS
Dimensions	32 x 19 x 6 cm
Weight	1.9Kg

Safety

Classification	Type B—IEC 60601-1-2006

Care of your DD250

After each use carefully wipe excess coupling gel from the transducer with a soft tissue. Never use alcohol or any other solvent to clean any part of the DD250, as these may cause damage. If cleaning becomes necessary wipe the DD250 with a damp cloth moistened with a mild detergent or Milton.
The transducer face is very delicate and may be damaged by dropping.

Simple fault finding

In the unlikely event of instrument failure, the following simple checks may be made before contacting your supplier for further advice.

- Unplug any headset and turn the volume control to maximum..
- Turn the unit on and observe the Battery Low indicator, if it does not illuminate, connect unit to a mains supply and try again.
- If the Battery Low indicator illuminates and then goes out (normal operation) stroke the transducer face.
- If no audio signal is heard in the loudspeaker consult your supplier.

When contacting your supplier with a problem please have available the instrument type and serial number. The serial number can be found on the rear of the unit.

Service

A service manual for this equipment, which includes circuit diagrams, parts lists and test procedures, is available and may be purchased from your supplier or directly from Ultrasound Technologies Ltd.

Warranty

Your DD250 is warranted for a period of 3 years against defects in material and workmanship. Any instrument that proves to be defective within that period will be repaired or replaced free of charge, provided that:

i) the instrument has not been damaged accidentally or by misuse or mishandling.
ii) no unauthorised attempts at repair have been made.
iii) the goods are returned to Ultrasound Technologies Ltd or its authorised representative freight pre-paid.

Under no circumstances whatsoever shall Ultrasound Technologies Ltd have any liability for loss or for any indirect or consequential damage.

Emissions

Care has been taken through the design and manufacturing processes to minimise the EM emissions that may be produced by this equipment. However, in the unlikely event that the unit causes an EM disturbance to adjacent equipment, we suggest that the procedure is carried out 'out of range' of the affected equipment.

Immunity

If the user has any doubt regarding the unit's EM immunity during routine operation, we suggest that the source of EM disturbance is identified and its emissions reduced.
If the user has any doubt regarding the identification and resolution of adverse EM conditions, please seek advise from Ultrasound Technologies Ltd.

This Equipment complies with the essential requirements of the European Council Directive 93/42/EEC + 2007/47/EC

CE
0120

Ultrasound Technologies Ltd
Lodge Way
Portskewett
Caldicot
NP26 5PS
United Kingdom

Tel: +44 (0) 1291 425425
Fax: +44 (0) 1291 427093
email: ultratec@doppler.co.uk
www.doppler.co.uk